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Social networks and aggressive behaviour in Chinese children

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This exploratory study investigated Mainland Chinese children's social networks and peer group affiliations with a particular emphasis on their aggressive behaviour. The participants were 294 elementary school students in Tianjin, P. R. China (mean age 11.5 years; 161 boys). Social network analysis identified relatively large and gender-specific peer groups. Although different measures were used, the pattern of homophily characteristic of Western aggressive children was partially supported. This finding may be due to the large size of the peer groups. The results showed that some aggressive children formed friendships with nonaggressive children. Moreover, for the aggressive children who were group members, the number of within-group friendships moderated the relation between aggression and overall peer preference. In addition, despite the moderating effect of within-group friendship, the relation between aggression and peer preference remained significantly negative even at the highest levels of friendship. Aggressive children who were isolated from all peer groups had higher hyperactivity ratings and were less liked by peers than were aggressive children who were group members. These findings illustrate how culture may be an influence on patterns of peer group affiliation.

The peer group is a salient context for the development of aggression in Western children (Cairns, Cairns, Neckerman, Gest, & Gariepy, 1988; Pellegrini, Bartini, & Brooks, 1999). Studies of children's social networks have found that some aggressive children are not necessarily rejected by all of their peers, but are often well-liked, and form reciprocated friendships with children who are similar to themselves in levels of aggressive behaviour (Cairns et al., 1988; Farver, 1996; Pellegrini et al., 1999). Furthermore, existing research has reported that throughout middle childhood and adolescence, children tend to form peer groups with those who are similar to themselves in gender, proximity, attitudes, and behaviour (Berndt, 1982; Cohen, 1977; Ennett & Bauman, 1994; Urberg, Degirmencioglu, Tolson, & Halliday-Scher, 1995). Relative within-group behaviour similarity found in Western children has been referred to as "homophily" (Kandel, 1978). Little is known about how Chinese children's peer groups are formed and organised, whether homophily exists among children in a non-Western society like Mainland China, and if aggressive Chinese children also cluster together in identifiable peer groups. Therefore, the primary objective of this exploratory study was to examine the characteristics of Chinese children's peer groups, with a particular focus on the group affiliation of aggressive children.

In general, Mainland China is considered to be more group-oriented than most Western societies (Oyserman, Coon, & Kemmemeier, 2002). However, surprisingly few researchers have examined Chinese children's peer groups and social networks. Studies of children raised in different cultural communities suggest that the structure and properties of their peer groups are mediated by predominant cultural goals, values, and beliefs. Thus, children's development and peer group behaviour cannot be understood away from the environments in which they occur (Farver, 1999; Goncu, 1999; Harkness & Super, 1996; Whiting & Edwards, 1988). The Chinese setting is of particular interest because of the traditional values that emphasise sensitivity to others, social harmony, and the salience of the group rather than the individual as an interpersonal dynamic. In a comparison of Chinese and European American children's social settings, Hsu (1981) maintains that Chinese children experience a highly involved and predetermined social world. In contrast to European American children, whose relationships are based on individual preference and their ability to choose to create, maintain, or cancel out personal relationships, Chinese children learn to "see the world as a network of relationships" (Hsu, 1981, p. 88). Chinese children cannot choose to change or break off relationships with individuals in their social world; instead, their primary concern is how to live with each other's differences and to get along.

This emphasis on harmonious interrelatedness permeates Chinese social relations among children as well as adults. The emphasis on the group is thought to originate in traditional Chinese agrarian society, which required large-scale group cooperation and strict responsibilities assigned to members for cropping, tending, planting, and harvesting and food storage (Nisbett, Peng, Choi, & Norenzayan, 2001). Most commonly, conflicts were quickly resolved through mediation and bargain-

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ing—typical of China's non-adversarial model of community justice to preserve valued harmony in interpersonal relationships (Cloke, 1987; Leung, 1987).

At the core of the Chinese value system are Confucianism, Taoism, and Buddhism, which guide social relations and underscore the importance of harmony, social obligations, and interrelationships. Specifically, Ryan (1985) asserts that Taoism promotes the rejection of self-assertion and competition, which may influence children's moral conduct by discouraging behaviours that further their own goals at the expense of others. Confucianism involves the perfection of interpersonal skills and an obligation to the community. Buddhism represents the self as composed of components that seamlessly link the individual to the family, community, and country (Ryan, 1985). Taken together, Confucianism, Taoism, and Buddhism view the self as a part of a larger whole comprised of natural, human, and spiritual entities; an individual's behaviour is inextricably linked to a responsibility for the group and one's relative status in the social hierarchy (Nisbett et al., 2001). The formation of groups is thought to be authority-oriented and consistent with role responsibilities stipulated by cultural norms and societal expectations. Thus, the cultural principles provide a philosophical basis and structure for social behaviour that reflects the needs, expectations, and anticipated reactions of others. Accordingly, verbal aggression, direct expression of emotion, and confrontations are avoided. Likewise, Chinese culture discourages the formation of small groups or cliques (*peng dang* or *xiao tuan ti* in Mandarin), because they might challenge the role responsibilities assigned in larger groups such as the peer classroom, and which can lead to in-clique/out-clique conflict. Therefore, large and authority-oriented social groups are viewed as a means to support a harmonious environment characterised by cooperation, negotiation, and shared interests.

The current socioeconomic conditions in Mainland China may contribute to shaping school classrooms, which, in turn, influence the organisation and function of children's peer groups. Chinese urban elementary schools typically have class sizes of 50 to 60 to serve the large numbers of school-age children. Although such large class sizes tend to be rare in most Western societies today, studies have shown that children have increased opportunities for peer interaction and reciprocated friendships when class sizes are large (Hallinan, 1979). In addition, classroom organisation may influence the configuration of children's peer groups by determining students' proximity and opportunities for interaction. In Chinese classrooms students are assigned to seats and to instructional groups (*xiao zu* in Mandarin) based on teacher or school regulation criteria. Thus, in contrast to many Western school classrooms, Chinese students cannot choose to sit next to their friends, or to those with whom they share common interests. Peer groups derived from proximity may be more heterogeneous than those developed in classrooms where children are permitted to select their own seating arrangements and instruction groups.

There has been little research carried out on Chinese children's peer relationships. Existing studies have reported that Chinese children are nonaggressive and friendly (e.g., Solvig & Olweus, 1986). For example, when second-grade American and Chinese children were presented with a series of ambiguous perceptual tasks, Chu (1979) found the Chinese children were more conforming and more likely to imitate a socially popular and high-achieving peer than were their American counterparts. Similarly, in a study of cooperation and conflict among Chinese and Canadian 5-year-olds, Orlick, Zhou, and Partington (1990) found that 85% of the Chinese children's behaviours were classified as cooperative, whereas 78% of the Canadian children's behaviour involved conflict.

The few Chinese children who are aggressive generally experience serious school maladjustment and difficulties in peer relations, as evidenced in self-reported and teacher-rated poor social competence, low sociometric ratings, and peer rejection (Chang, 2003; Chen, Rubin, Li, & Li, 1999; Xu, Farver, Schwartz, & Chang, 2003). While the negative outcomes associated with peer aggression are similar for Western and Chinese children, it has been speculated that the consequences of aggressive behaviour are much worse for Chinese children. In Chinese society, aggression is not tolerated and is viewed as uncontrolled behaviour in opposition to the goals of cooperation and interpersonal harmony. In general, children who behave aggressively are highly disliked by peers and are punished severely by school officials. Nevertheless, in a typical Chinese school classroom, there are always some aggressive children who are shunned as misfits or outcasts (Zhang, Gu, Wang, Wang, & Jones, 2000). Bond and Wang (1982) have argued that aggression is suppressed in China because it challenges the rank order in group dynamics, and that of group authorities. To be an in-group member, aggressive children who are normally shunned, must channel this behaviour into a form more in line with cultural norms, such as sociability or leadership, or they may need to organise with other aggressive children to form a new group.

Currently, Mainland Chinese society is experiencing significant industrialisation and modernisation. Residents of the mega-metropolitan areas, such as Beijing, Shanghai, or Tianjin, have experienced increasingly more contact with Western media and entertainment. Accordingly, it is possible that many Chinese people have begun to adopt some Western cultural values, which may gradually influence children's social behaviour and peer affiliations. For example, Chen, Chen, and Kaspar (2001) examined peer group affiliation patterns in a sample of elementary and high school students. They reported that the sizes of Chinese adolescents' peer groups were comparable to those in North American settings. Male groups had a mean of seven individuals and female groups had a mean of about five. Moreover, two studies (Chen, Chang, & He, 2003; Chen et al., 2001) found a moderate level of group homogeneity in children's aggressive behaviour using intraclass correlations (ICC = 0.18 and 0.13 respectively). These results suggested that although large peer groups have traditionally been the norm in Chinese elementary schools, aggressive children's group affiliations may be similar to those of Western contexts. That is, some aggressive children may form small cliques with other aggressive peers within the larger group.

Therefore, to address our primary objective, we examined the characteristics of children's peer group affiliation in light of four possibilities. First, similar to the pattern for most Western findings, we examined whether aggressive Chinese children affiliated with each other and formed their own social groups. In this case, we would expect within-group similarity in aggressive behaviour to be high because aggressive and nonaggressive children would be in different peer groups.

The second possibility was that some aggressive Chinese children would be included in nonaggressive peer groups

where members shared other interests or characteristics, rather than aggression. In this case, we would expect that the peer group members should be dissimilar in their aggressive behaviour because some aggressive and nonaggressive children would be in the same groups.

Third, assuming that aggressive children were included as members in heterogeneous peer groups, which would, in effect, challenge the general pattern of homophily reported for some Western aggressive children's peer groups, we would expect that despite their aggressive behaviour, some children have certain interpersonal skills that allow them to form reciprocated friendships with many group members, which provides them with entry into larger peer groups. We base this third possibility on studies of Western children's social networks, which have reported that some socially skilled yet aggressive children, who had more reciprocated friendships, were in fact ''nuclear'' members of large peer groups and had higher social preference ratings than did aggressive children with few reciprocated friendships (Cairns et al., 1988; Pellegrini et al., 1999; Schwartz, Dodge, Pettit, Bates, & The Conduct Problems Prevention Research Group, 2000).

The fourth possibility was that some aggressive children might be rejected by nonaggressive peers, and thus isolated from all peer groups. Previous Western studies comparing group members with isolated children showed that isolation from school-based friendship groups was associated with maladjustment in domains, such as self-reported and teacher-rated externalising and internalising problems (Hendrich, Kupermine, Sack, Blatt, & Leadbeater, 2000). Therefore, it is possible that some aggressive children may lack requisite social skills for making friends and maintaining group affiliation. Some aggressive children may be hyperactive and use aggression reactively (Pellegrini et al., 1999; Pope, Bierman, & Mumma, 1989; Schwartz, 2000) and aggressive children who have comorbid symptoms may be rejected from all peer groups.

We addressed these four possibilities in the current exploratory study using a social network analysis (SNA). In previous studies, Chen et al. (2001, 2003) used social cognitive map (SCM) analyses to identify peer groups. In the SCM, children are asked three questions: ''Are there people in school who hang around together a lot in school?'', ''Do you have a group that you hang around together a lot within school?'', and ''Who are these people you hang around with?'' Based on these nominations, the co-occurring group member nominations (the ''composites'') are used to derive the peer groups. The SNA program typically uses reciprocated friendships (or ''co-occurred'' friendships) as the unit of analysis, and it iteratively sorts individuals on a continuum until individuals who have more links are in adjacent positions. Because previous studies have established that dyadic friends tended to have more social interactions than did nonfriend peers (Homans, 1950), we were particularly interested in examining peer groups based on mutual friendship among group members.

In the current study, SNA, rather than SCM, was used to identify peer groups. SNA identifies specific peer groups within a school classroom and evaluates links or connections to other children within varied groups. Children can be classified into differing network positions, such as group members, liaisons, and isolates based on their number of within-group dyadic friendships.

Methods

Participants

The data were collected as part of a large project designed to examine peer relationships in Tianjin, China. Tianjin is one of the largest cities in P.R. China, with a population of about 10 million people. Tianjin is an industrial city, with most inhabitants employed in factories as technicians and workers, or as government employees. The majority of the population is Han Chinese. Most elementary schools in China are public schools. Each day students usually attend three to five 45-minute classes (three in the morning), with 10- to 15-minutes breaks in between.

In the participating school there were three fifth-grade and three sixth-grade classes, with approximately 50 students per class. The sample consisted of 296 children across the six classes (161 boys, 135 girls). Children ranged in age from 9.1 to 13.6 years ($M = 11.5$; $SD = 0.70$).

Procedure

Parents were contacted by their child's teacher in the weeks before data collection, and were given information regarding the study's goals and procedures. Because Chinese schools act in loco parentis, written parental permission was not obtained. Parents were informed they could choose not to participate without negative consequences; none chose to do so. Eight of the original 304 children were absent during the questionnaire administration and did not take part in the study. Two children with missing data were also not entered into the analyses.

Children's aggressiveness

The children were group administered a peer nomination inventory by trained Chinese research assistants. The inventory contained 16 items to assess social behaviour, such as aggressiveness, victimisation by peers, and so forth (Schwartz, Chang, & Farver, 2001). The findings concerning Chinese children's peer victimisation have been reported elsewhere (Schwartz et al., 2001; Xu et al., 2003). Only the aggressiveness subscale was used in the current study (four items: kids who start fights, push or hit others; gossip or say mean things about other kids; and exclude other kids from play to hurt their feelings; α coefficient of internal consistency = .89). Children were given a list of their classmates' names, and were asked to nominate up to three peers who fit each descriptor. The number of nominations for each item was standardised within each class and averaged across the aggressiveness scale. The average scores were used in the analyses as an index of *peer nominated aggressiveness*.

Teachers completed *the Social Behavior Rating Scale* (Schwartz et al., 2001). This measure contained 46 descriptors of children's social behaviour, including peer victimisation, aggressiveness, hyperactivity, and so forth. Teachers rated each descriptor on a 5-point scale (1 = *almost never true of the child*; 5 = *almost always true of the child*). In the current study only the aggressiveness (eight items; e.g., starts fights by hitting or pushing other children; taunts or teases other children; tries to get other children to stop playing with a peer; tries to hurt other children's feelings by excluding them, etc., $\alpha = .91$), and the hyperactivity (e.g., can't wait for a turn; $\alpha = .89$) subscales were used. Principle component analyses suggested that all

aggression items loaded on one factor and all hyperactivity items loaded on another (Schwartz et al., 2001). Teachers' ratings for each item were standardised within each class and averaged across the aggressiveness and hyperactivity subscales.

Peer preference

Children were asked to nominate up to three peers who they liked most, and three who they liked least, in their classrooms. The number of nominations for the two items was calculated and standardised within classrooms. A *peer nominated peer preference* score was generated from the standardised difference between the liked most and liked least scores (Coie, Dodge, & Coppotelli, 1982).

A teacher rating of peer preference was generated from the difference between the two 5-point Likert ratings: *child is well liked by other children* and *child is disliked by other children*. Teachers' ratings of children's peer preferences were standardised within each classroom; the scores were used in the analysis as an index of teachers' *rated peer preference*.

Social network

Children nominated friends in their classrooms using an unlimited nomination procedure. An unlimited procedure was used because it has been shown to have better psychometric (Holland & Leinhardt, 1973) and statistical (Chang, in press; Terry, 2000) properties than a limited nomination procedure, especially when the data are used to derive groups and make group comparisons (Chang, in press). Following previous researchers (e.g., Ennett & Bauman, 1994; Espelage, Holt, & Henkel, 2003), we also examined data using the children's first eight-choice nominations. This approach yielded the same number of peer groups as did the unlimited nomination, but with more liaisons and isolates. The following results were reported using the unlimited friendship nomination method. We used the NEGOPY program (Ennett & Bauman, 1994; Richards, 1989; Richards & Rice, 1981; Urberg et al., 1995) to identify and analyse children's social networks. NEGOPY requires information on at least 90% of the members of the social unit and an average of three or more links per member. In our study these requirements were met; 99% members and 5.9 links.

The NEGOPY program uses friendship nominations to classify participants into group or nongroup members. A reciprocal friend nomination was defined as a *friendship link*. NEGOPY's operational definition of a group was used to classify members into social networks: a group member had at least two links (reciprocal friends); more than 50% of these reciprocal friends were within the group; and the group remained connected even if up to 10% of the members were removed. This definition ensured that the groups were made up of members who had more friendship links with each other than with members in other groups.

The raw data in the NEGOPY are pairwise friendship links between individuals. Based on the group definition we mentioned above, the NEGOPY iteratively sorts individuals on a continuum until individuals who have more links are in adjacent positions. Individuals who have more friendships with each other than with other individuals are classified into a group. Finally, the NEGOPY uses some confirmatory statistics to test whether the derived groups satisfy the group definitions.

NEGOPY assigns every individual in the network to three mutually exclusive social positions based on the patterns of friendship links: group member, liaison, and isolate. (1) *Group members* are individuals who have at least two of their friendship links with group members; (2) *liaisons* are individuals who have friendship links with several groups at the same time, but do not belong to any specific group; (3) *isolates* include individuals who have no or only one friendship link with another individual. To validate the network positions assigned by NEGOPY, an analysis of variance (ANOVA) was applied to test the network position effects on number of friendship links. The F test yielded significant differences on friendship links between individuals with different network positions, $F(2, 291) = 29.45$, $p < .001$. Group members ($M = 6.67$; $SD = 4.10$) and liaisons ($M = 3.10$; $SD = 1.70$) had more friendship links than did isolates ($M = 0.90$; $SD = 0.90$).

Results

Social network and aggressiveness: Social network analysis (SNA)

To examine the size and composition of peer groups, we used SNA. The 294 children made 808 reciprocal friendship nominations. Reciprocated friendship nominations ranged from 0 to 26 per child ($M = 5.75$; $SD = 4.17$), with only 8.9% cross-gender pairs. There were no gender differences in the number of friendship links, $F(1, 293) = 3.28$, $p > .05$.

Eleven groups were identified with SNA. As shown in Table 1, each class had one large male and one large female group, except in class 3 for the fifth grade, where there was only one male group, with most females classified as liaisons. Seven of the 11 groups were gender-specific; made up of either all males or females. The other four groups were either mainly males (predominantly males with few females) or mainly females (predominantly females with few males); we classified these as male groups and female groups. Group sizes ranged from 16 to 33 for male groups, and from 18 to 25 for female groups. There was no significant difference in group sizes for males and females, $t(9) = 1.071$, $p > .05$.

Two hundred and forty children (81.6%; 136 males, 104 females) were identified as group members. Twenty-one children (7.1%; 8 males, 13 females) were categorised as liaisons. Thirty-three children (11.3%; 15 males, 18 females) were identified as isolates (i.e., without or with only one friendship link). A chi-square test showed that there was no significant interaction between gender and network position (i.e., group member, liaison, or isolate), $\chi^2(2) = 3.796$, $p > .05$. The distribution of network positions across gender, classes, and peer groups appears in Table 1. Because the cell sizes were limited for liaisons and isolates, loglinear comparisons were not conducted.

Characteristics of group members, liaisons, and isolates

The descriptive statistics for each variable are summarised in Table 2. A multivariate analysis of variance (MANOVA) was conducted to examine the overall effect of network position (i.e., group member vs. liaison vs. isolate), gender, and grade. The analysis revealed significant main effects of network position, Wilk's $\lambda = .707$, multivariate $F(12, 552) = 8.715$,

Table 1
Distributions of group members, liaisons, isolates across class, gender, and peer groups (N = 294)

	5th grade						6th grade					
	Class 1		Class 2		Class 3		Class 4		Class 5		Class 6	
	M	F	M	F	M	F	M	F	M	F	M	F
Group member												
Male group[a]	12	4[d]	22	0	22	3[d]	26	0	33	0	17	0
Female group[b]	0	22	0	18	0	0	1[c]	19	0	18	3[c]	20
Liaison	5	0	0	0	0	12	1	0	0	0	2	1
Isolate	3	4	5	3	1	6	2	3	0	1	4	1
Total	20	30	27	21	23	21	30	22	33	19	26	22

[a] Groups composed of all males or mostly males.
[b] Groups composed of all females or mostly females.
[c] Males who were members of female groups.
[d] Females who were members of male groups.
M = male; F = female.

$p < .001$, and gender, Wilk's $\lambda = .828$, multivariate $F(6, 276) = 9.585$, $p < .001$. The main effect for grade was not significant.

A series of post hoc univariate ANOVAs were conducted to examine how group members, liaisons, and isolates differed on each variable. As shown in Table 2, there were significant differences for all the variables except the dyadic friendship across gender. Because group sizes varied and were relatively small, results of MANOVA and the follow-up ANOVAs should be viewed cautiously. A conservative post hoc comparison procedure (i.e., Dunnett's T3) was applied to correct for the possible Type I error. The post hoc comparisons using Dunnett's T3 indicated that the group members did not differ from the liaisons in aggressiveness, peer preference, and hyperactivity regardless of which informant was used. The isolates had the lowest peer preference, highest aggressiveness, and greatest hyperactivity regardless of which informant was used. The group members had most reciprocated friendship and the isolates had the fewest reciprocated friendships.

Intraclass correlations

To address whether children within the same peer groups were similar in their aggressive behaviour (i.e., the first and second possibilities), intraclass correlations were computed using the groups identified through SNA. The intraclass correlation (ICC) measures the variation among the group means, or between-group variance relative to the variation among the observations, or within-group variance. ICC detects the degree of within-group similarity and reflects the magnitude of within-group similarity on specific characteristics. ICC's were computed separately for peers' nominations and teachers' ratings of children's aggressive behaviour. The ICC for peers' nominations were not significant for within-group similarity, (ICC = .051, $p > .05$). The ICC for teachers' ratings of aggressiveness showed significant within-group similarity, (ICC = .166, $p < .01$).

Because there were significant gender differences for peers' nominations, $t(292) = 6.22$, $p < .001$, and teachers' ratings, $t(292) = 5.38$, $p < .001$, of aggressive behaviour, we conducted

Table 2
Descriptive statistics for peers' nominations and teachers' ratings of aggressiveness and peer preference; reciprocated friendships, and teachers' ratings of hyperactivity (N = 294)

	Group members		Liaisons		Isolates				F	
	Boys (n = 136)	Girls (n = 104)	Boys (n = 8)	Girls (n = 13)	Boys (n = 15)	Girls (n = 18)	Skewness	Kurtosis	Group	Gender
PN aggressiveness	0.195	–0.351	–0.007	–0.391	1.346	–0.318	2.649	7.051	7.461**	19.169***
	(1.185)	(0.317)	(0.632)	(0.290)	(1.612)	(0.314)				
TR aggressiveness	1.815	1.384	1.922	1.721	2.308	1.465	1.562	2.452	3.533*	9.593**
	(0.862)	(0.528)	(0.986)	(0.339)	(0.848)	(0.433)				
PN peer preference	0.029	0.328	–0.209	0.151	–1.649	–0.591	–0.377	1.674	29.438***	7.977**
	(0.997)	(0.781)	(0.479)	(0.853)	(1.194)	(0.660)				
TR peer preference	1.309	1.962	–0.625	2.615	–1.200	0.667	–0.718	–0.406	15.659***	13.177***
	(2.002)	(1.900)	(2.446)	(1.387)	(2.396)	(2.275)				
Dyadic friendship	7.206	5.875	2.875	3.692	0.800	0.944	1.396	2.584	32.178***	0.164
	(4.453)	(3.516)	(1.356)	(1.888)	(0.775)	(0.416)				
TR hyperactivity	1.952	1.374	2.375	1.594	2.975	1.549	1.350	1.428	10.696***	35.903***
	(0.919)	(0.528)	(1.468)	(0.420)	(1.016)	(0.444)				

PN = peer nomination; TR = teachers' rating. Standard deviations are in parentheses under mean scores.
* $p < .05$; ** $p < .01$; *** $p < .001$.

separate ICCs for male and female groups. When using teachers' ratings, the results showed that male groups were characterised by a moderate level of similarity in aggressiveness, ICC = .138, $p < .01$. However, when using peers' nominations, there was low similarity in aggressiveness, ICC = .022, $p > .05$. Heterogeneity in aggressiveness was found in female groups for both peers' nominations, ICC = .015, $p > .05$, and teachers' ratings, ICC = .081, $p > .05$.

It should be noted that, to some extent, the distribution of both the peers' nominations and teachers' ratings of aggressiveness had relatively high skewness and kurtosis. Accordingly, a log-transformation was applied to these two variables, and the above ICC analyses were conducted with the transformed data. The results remained similar to those obtained with the nontransformed data. For example, the ICC for the log-transformed peers' nominations for aggressiveness was .066, $p > .05$, and the ICC for the log-transformed teachers' ratings of aggressiveness was .170, $p < .01$.

Within-group friendship as a moderator

To address the third possibility, that within-group reciprocated friendships would moderate the relation between children's aggressiveness and overall peer preference, a series of hierarchical regression analyses were computed. The number of within-group reciprocated friendship links was standardised within each group, and these standardised scores were used in the subsequent analyses.

Separate analyses were conducted for peers' nominations and teachers' ratings. In the regression model, overall peer preference in the whole classroom was predicted from the main effects of aggressiveness and within-group friendship (entered on step 1) and the interaction between aggressiveness and within-group friendship (entered on step 2). As shown in Table 3, there was significant interaction effect for aggressiveness and within-group friendship for peers' nominations. There was no significant interaction effect when using teachers' ratings.

To understand the nature of this effect, the procedure proposed by Aiken and West (1991) was used to examine relations between peers' nominations of aggressiveness and overall peer preference at low, medium, and high levels of within-group friendship. As shown in Figure 1, the slope of the relation between aggressiveness and overall peer preference declined as the level of within-group friendship increased. However, the slopes at low, medium, and high levels of group status were all significant ($p < .01$).

Because there were significant gender differences in aggressiveness, we also examined how gender might moderate within-group friendship. A separate, simultaneous regression analysis using peers' nominations was conducted. In this regression model, overall peer preference was predicted from the main effects of aggressiveness, within-group peer preference, and gender; the two-way interaction terms for within-group friendship × gender, within-group friendship × aggressiveness, and aggressiveness × gender; and the three-way within-group friendship × aggressiveness × gender interaction. There were no significant three-way interactions.

Highly aggressive children who were isolated from peer groups versus highly aggressive children who were group members

To examine the fourth possibility, that some aggressive children may have been isolated from all peer groups and may manifest more behaviour problems than aggressive children who were included in peer groups, we compared the overall peer preference and teachers' ratings of hyperactivity for aggressive children who were isolates and group members. First, we identified the highly aggressive children who had standardised scores of peer nominated aggressiveness higher than 1.00. This strategy identified 8 highly aggressive children who were isolates and 25 highly aggressive children who were group members. These children were all males except for one girl, and she was excluded from further analyses. Second, a series of *t*-tests was conducted to compare the two groups. The results showed that highly aggressive children who were isolates had lower scores on both peers' nominations, $t(31) = 3.115$, $p < .05$, and teachers' ratings, $t(31) = 2.544$, $p < .05$, of peer preference than did children who were group members. The isolated children were rated as more hyperactive than those who were group members, $t(31) = 2.551$, $p < .05$. The two groups of highly aggressive children did not differ on peers' nominations or teachers' ratings of aggressiveness.

Discussion

Peer groups are important socialisation contexts. However, social groups and peer networks are not merely the creation of children; the broader cultural and social environments of schools, teachers, and parents also contribute to the formation and dissolution of social groups (Cairns et al., 1988). Friendship and peer group affiliations reflect culturally adaptive values or norms that are expressed within the constraint of particular environments, such as school classroom size and organisation. The Chinese context provided a unique opportunity to explore how culture shapes children's developmental environments.

The results from this exploratory study suggest some interesting cultural variations in children's patterns of affiliation. First, the SNA analysis failed to identify small cliques of

Table 3
The moderating role of within-group friendship in the relation between children's aggressiveness and overall peer preference

	Step 1				*Step 2*		
	Main effect of within-group friendship		*Main effect of aggressiveness*		*Within-group friendship × aggressiveness*		*Full model*
Criterion variable	β	sr^2	β	sr^2	β	sr^2	R^2
Overall peer preference	.360	.130***	–.454	.206***	.115	.013*	.341***

* $p < .05$; *** $p < .001$.

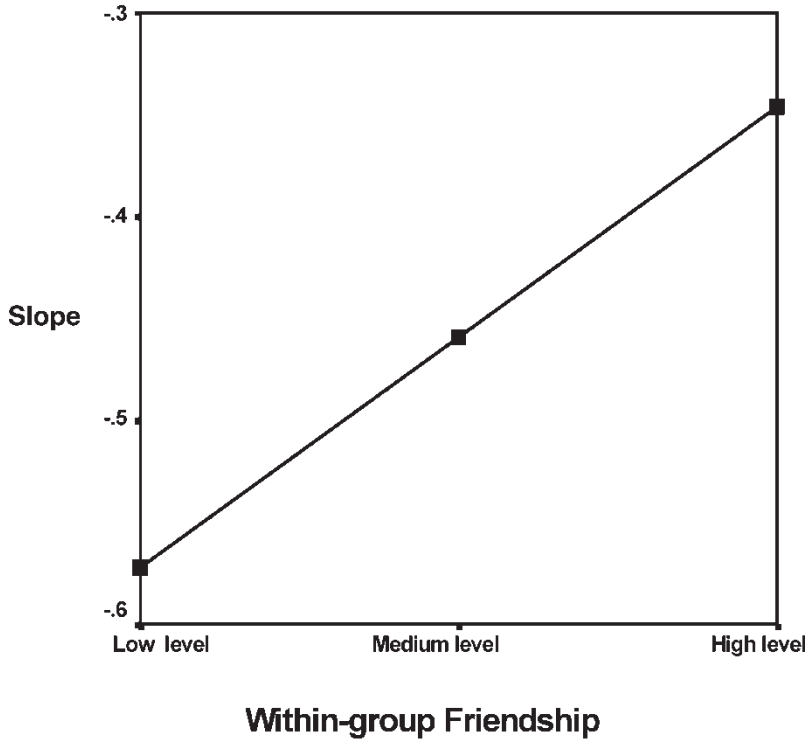

Figure 1. Changes in the slope of the relation between peer-nominated aggressiveness and overall peer preference at different levels of within-group friendship. Low level was fixed at 1 *SD* below the mean of within-group friendship links, medium level at the mean of with-group friendship links, and high level at 1 *SD* above the mean of within-group friendship links. All slopes were significant ($p < .001$).

Chinese children. For each classroom, only one or two large groups were identified and most were gender-specific. Large class size, stable class composition, and teachers' typical manipulation of proximity seating (i.e., seating "bad" or aggressive children near "good" children in the classroom and encouraging their interaction), may contribute to the formation of large peer groups and social networks. Second, our results only partially confirmed the peer group similarity of aggressive children. When male and female groups were pooled together, group members were found to be relatively similar when rated by their teachers for aggression, but not when nominated by their peers. When male and female groups were considered separately, teachers' ratings of male group members were similar in aggression, but this was not the case for peers' nominations. For female groups, there was no evidence of homogeneity in aggression regardless of which informant made the rating.

The differences in the pattern of homophily for Chinese children's peer groups may be related to the relative freedom children have in choosing their friends, the lack of tolerance for aggressive behaviour, and the degree to which aggressive children have opportunities to form small cliques where members provide mutual support for the expression of aggressive behaviour. For example, homophily might not make sense in settings where children cluster together in large peer groups, rather than in small cliques. Obviously, children in large groups are less likely to share many similar characteristics and behaviour patterns than are children in small groups. Moreover, since aggressive behaviour is actively discouraged, Chinese parents and teachers may be particularly sensitive to this negative influence on peer interaction, and may be more likely to exert control and maintain direct supervision over the group affiliations of aggressive children. Accordingly, unlike their Western counterparts, it would be very difficult for aggressive children to form small homophilous peer groups in highly regulated Chinese settings, especially given the fact that children are discouraged from forming small informal groups because they are viewed as threatening adult authority (Chen et al., 2001).

Our results may also be related to the difficulty of measuring children's social behaviour across informants and settings. Teachers and peers have different perspectives on children's aggressive behaviour because they have varying access as to where, when, and towards whom aggressive behaviour occurs. Teachers may attend to aggressive children who have been isolated from peer groups, and neglect children who are aggressive but who also have adaptive social skills. For most teachers, and particularly Chinese teachers, isolated aggressive children are probably more salient and more at risk. Accordingly, when asked to rate children, teachers might give relatively homogeneous aggression ratings to group members than to nongroup members.

A case can be made that peers have their own vantage point on their classmates' aggression; basically because they are able to observe and personally experience aggression that occurs outside the watchful eyes of their teachers. Whether aggressive children are group members or isolates probably does not influence peers' nominations much, since these scores are accumulated from all children in each classroom. However, from their point of view, children may be better than teachers at identifying peers who are both aggressive and relatively socially skilled (and, most likely, group members). Therefore, children might appear to be relatively similar to teachers in their aggressiveness, as long as they are not isolated from peer

groups. However, it is possible that this similarity or homophily cannot be replicated by peers' nominations because of the children's sharpened viewpoint.

Although female groups were found to be heterogeneous in aggressive behaviour regardless of informant, this finding could be confounded by the fact that few Chinese girls were isolated from peer groups. Because most girls in each class were classified into one female group, as mentioned earlier, homophily was unlikely to occur given that females clustered together in large peer groups.

Homophily received limited support with aggressive Chinese children. However, a test of the moderating role of within-group friendship in the relation between children's aggressiveness and overall peer preference supported Cairns et al.'s (1988) findings. That is, some aggressive children may have some hidden competencies that help them achieve peer support. In our data, we found that having more within-group friendships actually helped aggressive children achieve higher overall peer preference. Here, the hidden competence was successful friend-making within peer groups. These results were interesting because having more within-group friendships seemed to be a marker of children's capability in social interactions, which in turn had a positive effect on the overall peer reputation of aggressive children. However, the relation between aggressiveness and overall peer preference remained significantly negative even at the highest level of within-group friendship.

Although our analyses for the fourth possibility were based on a small sample of isolated aggressive children, the results nevertheless were in line with previous findings reported for Western children. That is, isolated aggressive children tended to have the worst developmental outcomes among the aggressive children (Hendrich et al., 2000). The high hyperactivity ratings and low peer preference scores indicated that isolated aggressive children may have some deficit in multiple interpersonal functions, such as possible comorbid ADHD or emotional dysregulation. However, because our study was exploratory, we did not examine the competencies that nonisolated aggressive children use to form within-group friendships and obtain peer preference, and which differentiate them from isolated aggressive children. We suspect that these competencies might be interpersonal skills such as sociability or leadership. This hypothesis needs to be tested in future studies.

Our findings suggest a cultural model for peer group affiliation, particularly with regard to aggressive children in the Chinese context. In Western contexts, homophily might be an optimal way for aggressive children to affiliate with others because of relatively relaxed restrictions on friendships and the shared peer experience among aggressive children. Being a nuclear group member in an aggressive clique may give Western children a positive self-image and a sense of domination over others. However, the ways that are optimal for Western children might not work for Chinese children because they conflict with cultural norms for effortless social interactions. Additionally, Chinese parents and teachers are highly involved in engineering children's friendship circles and in facilitating peer interactions (Chang, Liu, Wen, Fung, Wang, & Xu, in press; Chao, 1994). Adults make every effort to ensure their children have a ''good'' friend, even to the point of sacrificing a child's freedom of choice. Under such circumstances, it is not hard to imagine that most aggressive children would have difficulty in making friends with other aggressive peers because aggressive behaviour is so salient to parents and teachers. Furthermore, aggressive children are likely to be isolated from their peer groups if they cannot make friends with nonaggressive peers. Perhaps an optimal way for aggressive Chinese children to achieve group affiliation is to use their concealed competencies, such as sociability or leadership skills, to make friends with their nonaggressive peers. Our findings suggest that having more within-group friends indeed elevated aggressive children's overall peer preference, indicating a culturally adaptive way for aggressive children to affiliate with peers and to obtain peer preference.

Despite the interesting pattern of findings, some cautionary remarks should be mentioned. First, we used NEGOPY's group definition to identify peer groups in our study. Compared to the social cognitive map developed by Cairns and his colleagues (1988), NEGOPY was appropriate here because we had more than a 99% participation rate, and all the friendship links were reciprocated for all participants. However, our analyses were based only on the children in the same classrooms, and did not include possible friendship links outside children's school classes. Children could have friends in other classes but in the same grade; they could have friends in other grades, especially higher grades; and they could have friends outside the school in their neighbourhoods. These outside friends are hard to measure, are generally undetected by school teachers, and possibly escape school sanctions. If this is the case for aggressive children, more comprehensive analyses are needed to fully capture children's friendship networks and peer groups outside the school classroom.

Second, our findings for peer group sizes and within-group similarity in children's aggression differed from results reported by Chen et al. (2001, 2003). These divergent findings may be attributed to the different approaches used to identify the peer groups. That is, we used SNA, whereas Chen et al. used SCM. However, this interpretation is not in line with previous studies which found that the peer group sizes derived from these two strategies did not differ significantly among North American children and adolescents (e.g., Espelage et al., 2003; Kindermann, 1993; Urberg et al., 1995). Moreover, while the mathematical and statistical procedures differ in the NEGOPY and the SCM methods, the inherent logic is similar. They both derive peer groups from what Breiger (1988, p. 84) referred to as the P-matrix of ''person-to-person relation.'' Therefore, it is important to examine patterns of children's peer group affiliation using both approaches.

Third, in the current study, a broad assessment of aggression was used, which might obscure the potential peer influence on group affiliation. Research has suggested that verbal forms of aggression tend to be more accepted among peers than physical forms, especially in older children (Craig, 1998; Rivers & Smith, 1994). Perhaps if we had a measure for both verbal and physical forms of aggression, the homophily of aggressive children could have been identified in Chinese settings as well.

Fourth, our SNA was based on peers' nominations of reciprocated friendships. Whether the concept of friendship is the same in Chinese and Western cultures requires further examination. For example, in a comparison of Japanese and German school children, Takahashi and Hirai (2002) found that the Japanese children had an average of 19 friend choices, whereas their German counterparts had about 9. In addition, the Japanese children tended to classify most playmates (literally ''just a kid I know'') as ''friends,'' whereas German

children had relatively strict criteria for whether a playmate was identified as a ''friend'' (e.g., closeness). These results suggest that an in-depth study on the cultural understanding of friendship is necessary to interpret our results. For instance, it is possible that nominating a ''close friend'' rather than a ''friend'' is more appropriate in the Chinese context to identify peer groups.

Fifth, our data were collected in a school in a large Chinese city. Therefore, the participants were not representative of Mainland Chinese children. China is a very diverse country, and using a sample from a large city does not begin to cover the broad heterogeneity. Also, with the recent economic changes, many Chinese people have begun to adopt Western cultural values producing considerable within-culture variability, which may in turn directly influence children's social development and behaviour. Future research should be carried out in both urban and rural areas of China. Nevertheless, this small, exploratory study was a first step in attempting to understand children's social behaviour across diverse settings.

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